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Millersville University

Enhanced AV Classroom Specification

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Version 5.01

Millersville University Enhanced AV Classroom Specification

The vendor shall follow all applicable National Electrical Codes, State and County codes and local ordinances. It is the vendor's responsibility to obtain the necessary permits.

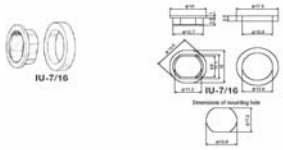
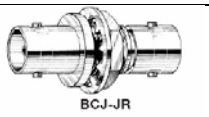
The Data/ Video projector and AV lectern system must share the same electrical circuit or, if this is not possible, be on circuits of the leg at the electrical panel.

The vendor shall install only Plenum rated wire and cable inside of Millersville University building walls and ceilings.

The vendor shall terminate all of their plenum coax BNC compression connectors.

With respect to building wiring, the vendor shall use the following wire, cable, electrical components and physical components or their electrical and physical equivalents.

Number of Cables	Vendor Part Number	Vendor Description	Suggested Vendor/ Manufacturer	Where to Install
1	22-159-03	STP 20 Plenum	Extron	For use inside walls or ceilings. One pair run from designated wall plate location to designated Smart Board location for RS 232 control
1	22-159-03	STP 20 Plenum	Extron	For use inside walls or ceilings. One pair run from designated wall plate location to designated projector location
1	22-130-02	BNC 6 Mini HR Plenum	Extron	For use inside walls or ceilings. One pair run from designated wall plate location to designated projector location For RGBHV and NTSC Video signals
1	22-129-02	BNC 2 Mini HR Plenum	Extron	For use inside walls or ceilings One pair run from designated wall plate location to designated projector location For S-Video signals
2	22-155-03	SPK 14 Plenum (1 pair 14 AWG)	Extron	For use inside walls or ceilings 2 pair of cables run from a designated wall plate location to designated speaker location

Qty per plate	Part #	Description	Suggested Vendor Manufacturer	
1	IU-7/16 RD	Color Coded Wall ID Ring; Color Red	Canare; Markertek Video Supply, TecNec	
1	IU-7/16 BE	Color Coded Wall ID Ring; Color Blue	Canare; Markertek Video Supply	
1	IU-7/16 YW	Color Coded Wall ID Ring; Color Yellow	Canare; Markertek Video Supply	
1	IU-7/16 GN	Color Coded Wall ID Ring; Color Green	Canare; Markertek Video Supply	
3	IU-7/16 WE	Color Coded Wall ID Ring; Color White	Canare; Markertek Video Supply	
1	IU-7/16	Color Coded Wall ID Ring; Color Black	Canare; Markertek Video Supply	
8	BCJ-JR	Canare BNC Female to BNC Female Chassis Mount Connector	TecNec	
8	100-186-01	BNC male Mini HR Compression connectors	Extron	

The vendor shall fashion & install 2 interface plates on the wall where their building wiring will be terminated. The plates shall be double gang, black colored steel or anodized aluminum, with engraved designation filled with white paint. The plates shall be configured as shown in the AV Smart Classroom Drawings “Wall Interface Plate #1 and Wall Interface Plate #2”.

The Speaker and RS 232 cable connectors shall be a Neutrik Speak-On Connector and a Neutrik 6 Pin XLR chassis connector shall be soldered according the schedule. ***Each wire*** shall be dressed with ***Clear heat shrink tubing.*** See the drawing for details about the XLR connector assembly. The vendor shall not exceed the manufacturers maximum bend radius for any cable.

At the projector location: The RGBHV coax will be terminated with a HD-15 D style connector. ***Each wire*** in the connector housing shall be dressed with ***Clear heat shrink tubing.*** The S-Video cables will be terminated with compression BNC connectors and the Video cable will be terminated with either a BNC compression connector or RCA compression connector to match the video input connection on the data projector.

Internal lectern wiring and service connections to the wall plates

The presence of electrical tape is unacceptable in the finished assembly of the lectern or its umbilical cord.

All solder connections shall be dressed with clear heat shrink tubing

With respect to the lectern wiring and the Umbilical cord (the interconnect cable that connects the lectern to the building wiring), the vendor is urged to use the wire and cable specified in the accompanying list of materials. If the vendor chooses to make substitutions those items shall be electrically and physically equivalent.

The vendor shall provide a support structure for wiring harness inside the lectern cabinet.

The vendor shall fashion and install an interface plate for the inside of the lectern cabinet. This plate will provide termination point for the cabinet end of the Umbilical cord. The plate shall be populated as shown in AV Smart Classroom Drawings, “Link Internal Interface Plate” This plate will also provide a mounting point for a 3 Com; model NJ 220 Intellijack. Note; that the layout of the connectors clone those shown in

AV Smart Classroom Drawings, Wall Interface Plate #1" and "Wall Interface Plate #2". The connector designations shall be engraved into the plate and filled with white paint. The plates shall be black in color.

The vendor shall use non plenum rated cable for point to point connections inside the lectern and in the construction of the umbilical cord.

The vendor shall use **pre-manufactured** VGA cables, VGA break out cables, Network cables and USB cables in the assembly of each lectern.

The Vendor is encouraged to field terminate all cables and wiring that will make up the umbilical cord which includes: RGBHV cable, S-Video cable, Video cable, RS 232 cable(s), speaker cable, tether cable, CATV cable. Additionally, the vendor shall terminate control cables, IR cables and audio cables internal to the lectern.

The vendor shall dress all the cable ends of the Mini HR (S-Video & Video) with strain relief-s as depicted in the drawing tilted "Umbilical cord Color Codes".

Additionally, the vendor shall install white heat shrink tubing per the schedule shown in the system drawings and the section titled "Umbilical Cord Construction".

The vendor shall dress all the coax cable with strain relief-s.

The vendor will dress signal bearing wire or cable away from AC power cords.

The vendor shall not over tighten nylon wire wrap used to secure wiring within the lectern cabinet. If nylon tye-wraps are used the seize tension of the tye-wrap shall be so great as to inhibit the tye-wrap from being rotated about the wire bundle that it secures.

The vendor shall not bundle by use of ***electrical tape or tie-wrap*** any cable or wiring to be inside the expandable sleeve also known as the Umbilical cord.

The Umbilical cord shall be dressed through pre cut opening in the bottom of the lectern cabinet. Additionally, the main power cord shall be dressed through the same opening.

The vender shall use "3M Dual Lock Fastening system" or its equivalent. to affix all power supplies and other modules to the floor of the lectern. Velco fastening systems consisting of felt are not acceptable.

Cable Cubby:

The cable cubby will have three cables that can be pulled from the user compartment. The vendor must provide management that assists the return of these cables to the cubby compartment.

Umbilical cord construction:

Umbilical cord construction shall consist of Expandable Braided Non Fraying Polyester sleeve Alpha GRP-110NF or equivalent. The finished length of the Umbilical Cord shall be 20 feet. The cord should be constructed such that it can easily and repeatedly coiled and uncoiled around the cable rungs inside of the Link cabinet without kinking of the cabling inside of the expandable sleeve.

Inside the sleeve, the vender shall install:

1	Extron Mini HR 6 (RGBHV & Video) or its equivalent
1	Extron Mini HR 2 (SVHS Chrominance & Luminance) or its equivalent
1	Extron RG6 HR1 RG-6 CATV or its equivalent

2	SPK 14 (1 pair 14 AWG) (Belden 8473) or its equivalent
1	1/8' vinyl coated steel aircraft cable
1	Cat 6 Network Patch Cables, Color: Green, configured for 568B Termination
1	Extron STP 20 DUAL cable or its equivalent

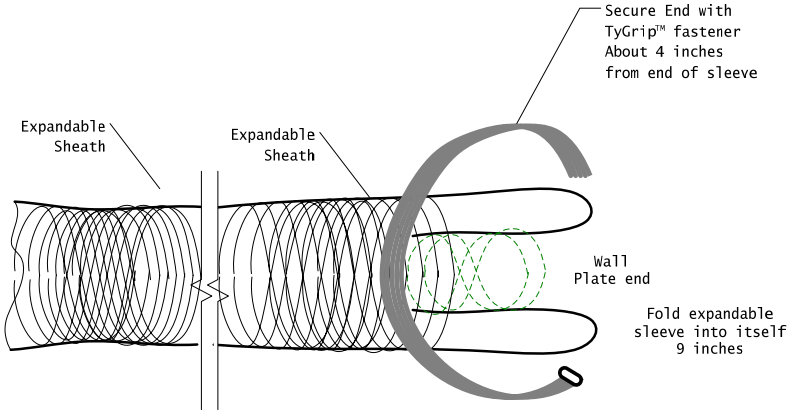
After the above components have been pulled through the expandable sleeve, the sleeve shall be terminated as follows:

- Leave cable tails of about 12 inches for connection to the building and the connection plate inside the Link cabinet wall plates. Note: The CATV and network cables may be longer to reach their respective connections.

- The 1/8 inch steel cable should be about 6 inches long after it has been terminated with a thimble and Gripple™.

- Fold the end of the Expandable sleeve back into itself about nine inches. See figure 1. Secure with TY-Grip™ fastener. (See spec sheet for fastener part number) Insert a snap hook through the thimble eye.

Figure 1



- Remove the excess slack in the expandable sleeve. The sleeve should hug the internal cables within it.

- Connect one umbilical cable tether to the eyebolt in the wall connect the opposing end to the eye bolt inside the lectern cabinet.

- The Umbilical cord cables that support Video, S-luminance S-Chrominance signals shall have **white** heat shrink tubing installed behind the cable strain relief-s, of the aforementioned cables. Please refer to the drawing titled “Umbilical cord Color Codes”.

Acceptance Testing

Acceptance testing shall be based on the adherence of the aforementioned specifications and vendor craftsmanship.

The lecterns when assembled shall be free of construction dust and debris. All visible surfaces shall clean and free of oils and other manufacturing compounds.

All indicator lamps must be working.

All panels should be in place.

All specified color designations and engraved markings should be clearly visible on the vendor installed wall plates.

All connections including the CATV, network cables and tether cable should be in place.

All ceiling tiles should be in place and free of construction damage.

The vendor shall certify that all ceiling speakers are tethered to an appropriate fixed ceiling structure.

Drop ceiling components are not acceptable as fixed structures.

The vendor will certify that the all the network connections are functioning @ CAT 5E specification.

The vendor will certify that the sound is evenly distributed by injecting an audio sweep generator signal operating between 20 Hz to 20 kHz into the system amplifier and measure the SPL in db throughout the room. SPL levels shall not vary more than 2 db from speaker to speaker. All speakers should reproduce sound of equal timbre.

Projection System

Projector mounting systems shall be physically attached to the building via anchors driven into the cement or bolted to ceiling struts, etc. **Drop ceiling components are not acceptable as fixed structures**.

The data projector should power up and down via a button presses from either the lectern desktop key pad or the System 5 IP front panel.

The vendor shall inject a Crosshatch signal into the projection system preferably through the Guest Computer port the projector image of that signal shall be free of geometric distortion including keystone issues, centering issues, focus issues, brightness & contrast issues and clock phase and timing issues. **The image shall not overshoot the projection screen.**

The projector should respond quickly to input changes via the lectern desktop and the System 5 front panel.

The RS-232 connection shall be tested by connecting a serial cable to the 5 IP controller and successfully reading the projector statistics through the 5 IP configuration program.

Device control

The Desktop key pad:

- Function/ Room button number 2 shall be programmed to power on and power off lectern DVD /VCR combo player when pressed.
- Function / Room button number 4 shall be programmed to eject a DVD disk and/ or a VHS tape from the DVD/ VCR combo player when pressed.
- Shall mimic the functions of the DVD/ VCR remote control including: Play, Stop, Skip forward, Skip backward, Fast forward, Fast reverse, Menu, Chapter/ Track selection, Enter, Pause, Channel selection etc.
- The sound from these devices should be clear and free of clipping distortion. Acceptance is dependent on the successful demonstration of the aforementioned using a DVD disk and a VHS tape.

Guest Laptop and local CPU

A laptop computer shall be connected to the desktop guest VGA, Audio and Network cables emanating from the cubby. The Ethernet cable, Audio cable, both USB ports and the AC power outlet are part of the acceptance test. The laptop desktop image should be un-cropped, clear and the output audio should be clear and free of clipping distortion when playing through the speaker system.

As part of the acceptance test the lectern CPU will be activated; the network should accessible. Additionally, its desktop should appear un-cropped and properly centered on the viewing screen. Sound from this device should be clear and undistorted when played through the sound system. The desktop USB ports must be functional. A USB device shall be inserted into each desktop USB port that device should be recognized by the lectern CPU.

Documentation:

The vendor will supply all user manuals in print and CD's containing PDF files for all the equipment in the classroom installation, projector, lectern, etc.

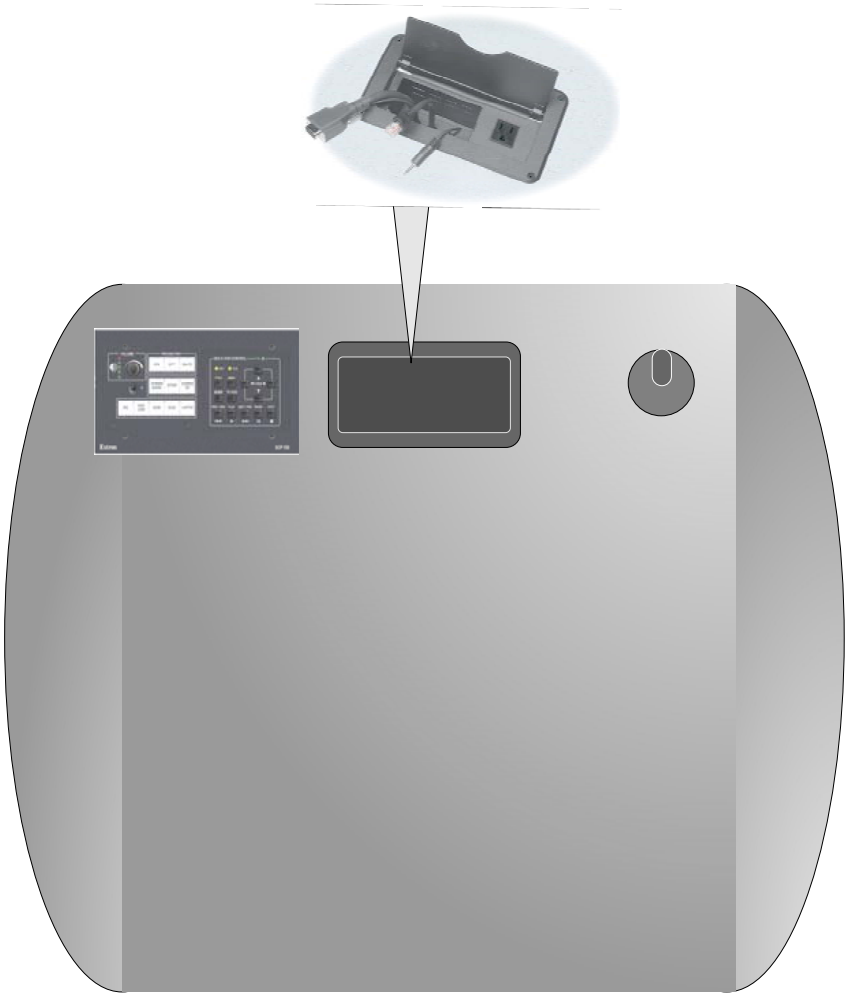
The vendor will supply on CD all IR and serial drivers, protocols, software, access codes, source & object code used in the install.

The vendor will supply an AS built on CD of the entire project including a parts list, full schematics, connector pin-outs and related drawings.

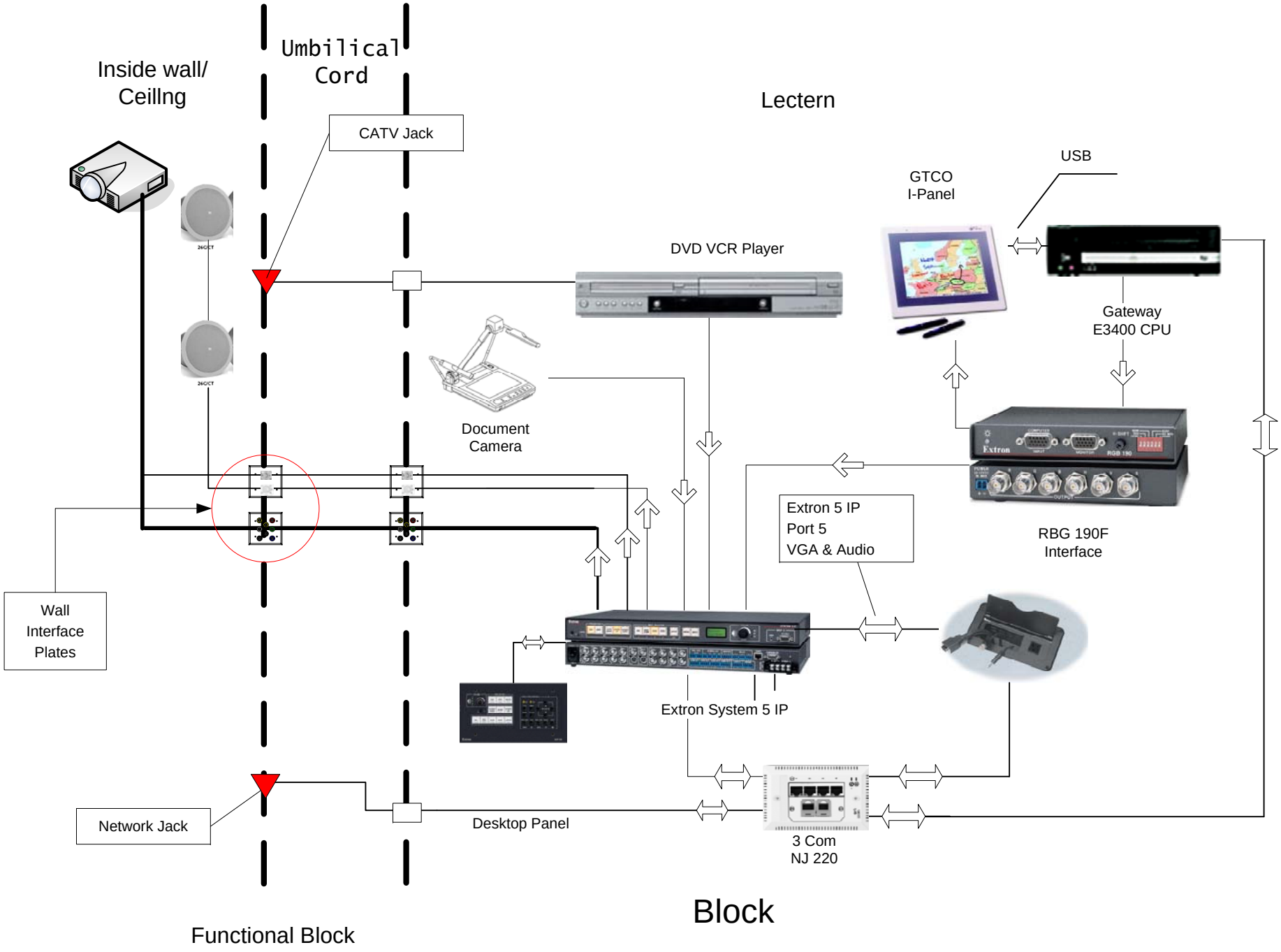
Special Provisions:

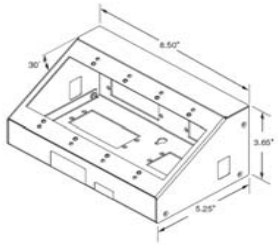
The VHS recorder player must be compatible with VHS tapes recorded at SP Standard Play, SLP Super Long Play and LP Long Play

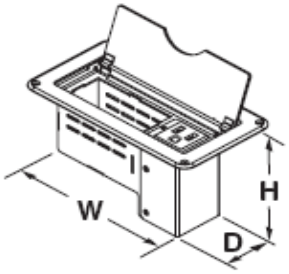
Link cabinet top
Show with:
Extron SCP 150
Extron CC 200 Cable Cubby



Rear


Inside wall/
Ceillng
Umbilical
Cord
Lectern
CATV Jack
USB
GTCO
I-Panel
DVD VCR Player
Gateway
E3400 CPU
Document
Camera
Extron 5 IP
Port 5
VGA & Audio
RBG 190F
Interface
Wall
Interface
Plates
Extron System 5 IP
Network Jack
Desktop Panel
3 Com
NJ 220
Functional Block
Block





17.25 in.

3.8 in.

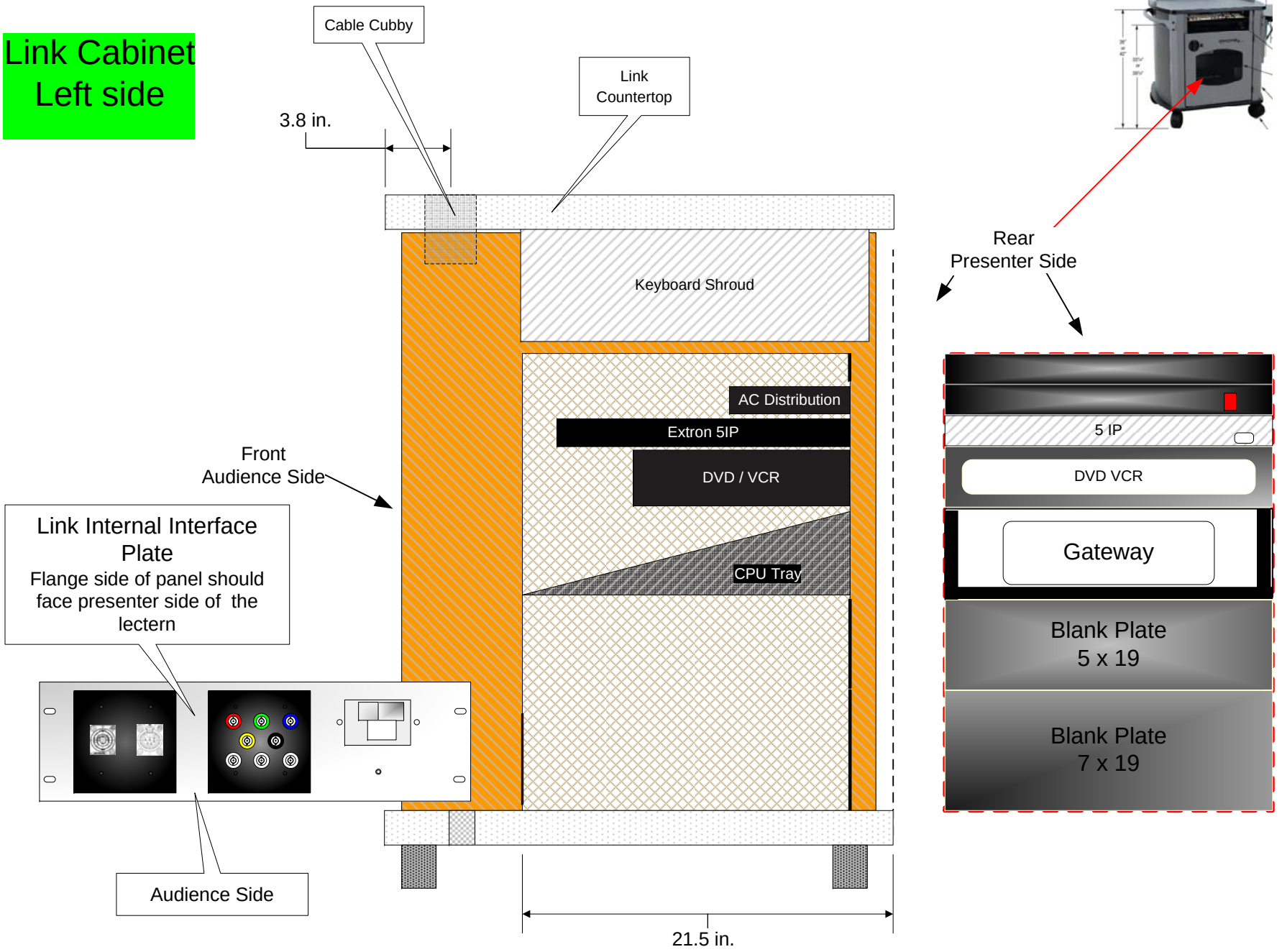
Cable Cubby

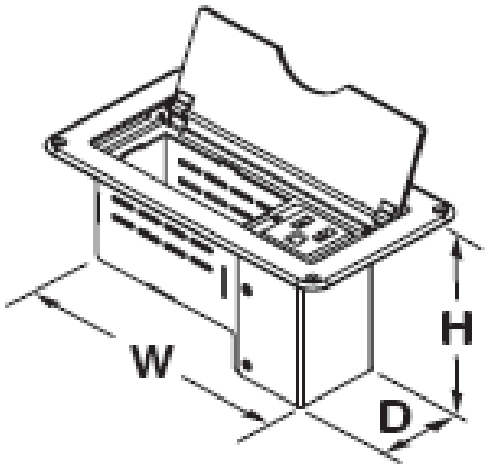
29.5 in.

Presenter Side
Rear

Link Lectern
Top View

Link Cabinet Left side





Extron part number :

60-716-0A

Cable Cubby 200

Cable Cubby 200

Top plate (outer rim)	8.000" W x 4.394" D (20.32 cm W x 11.16 cm D)
Surface cutout (inside rim)	7.185 ±0.0325" W x 3.155 ±0.0325" D (18.25 ±0.083 cm W x 8.01 ±0.083 cm D)
Box (under surface)	4.000 " H x 7.120" W (front/rear of unit) x 2.974" D (10.16 cm H x 18.08 cm W x 7.55 cm D)

Spectrum Link
Rack layout

Presenter Side
Rear View

Keyboard Slide

Audience side of link Cabinet
(Front)

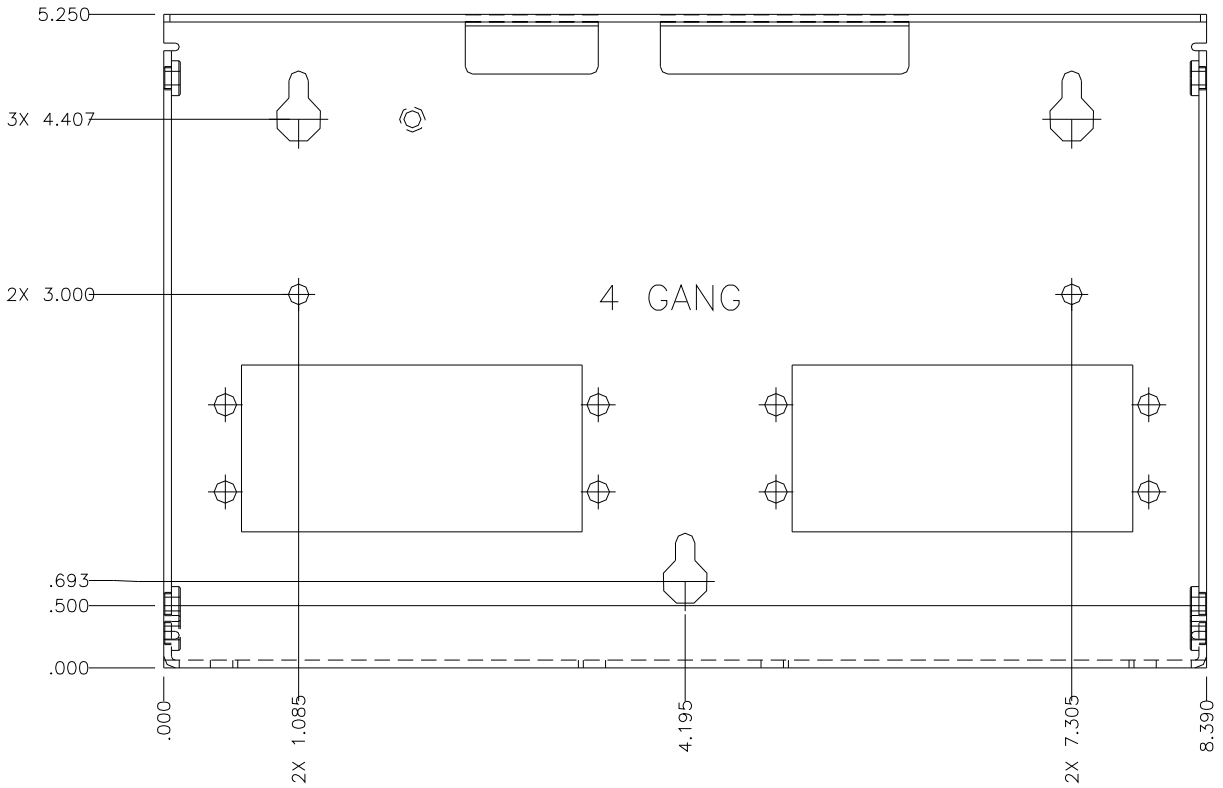
Blank 1U
Outlet strip 1U
Extron 5IP 1U
5 IP
DVD VCR 2U
DVD VCR
Shelf 3U
Gateway
Blank 3U
Blank Plate
5 x 19
Blank 4U
Blank Plate
7 x 19
15 Units

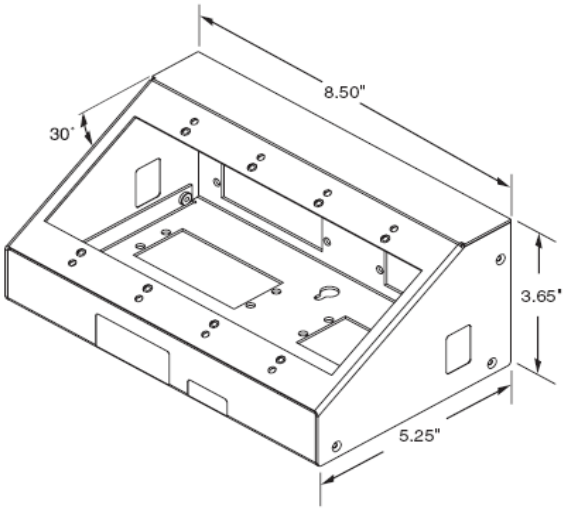
Interface
Plate 3U

U = Units
1U = 1.75 inches

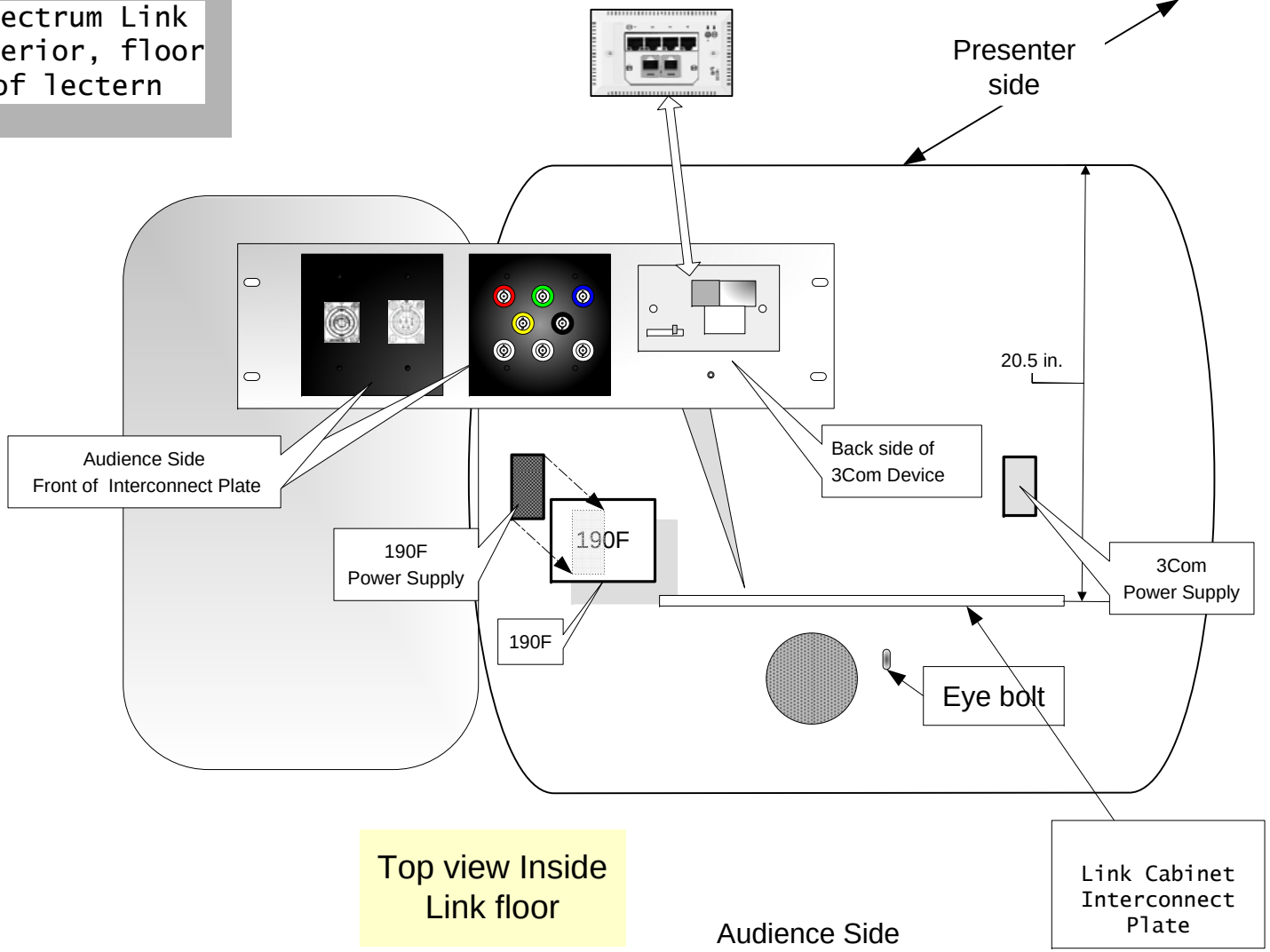
Presenter Side
Rear View

Extron Surface Mount Box SMB4





Spectrum Link Interior, floor of lectern

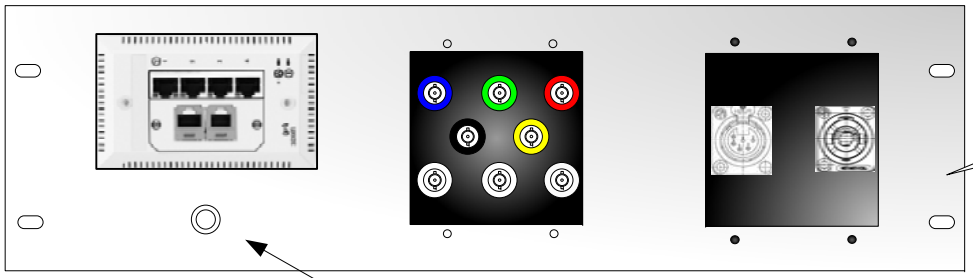


Top view Inside Link floor

Audience Side Front

Link Internal Interface Plate

Presenter Side
Rear View

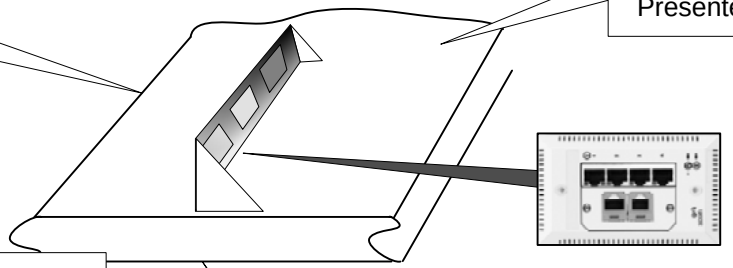


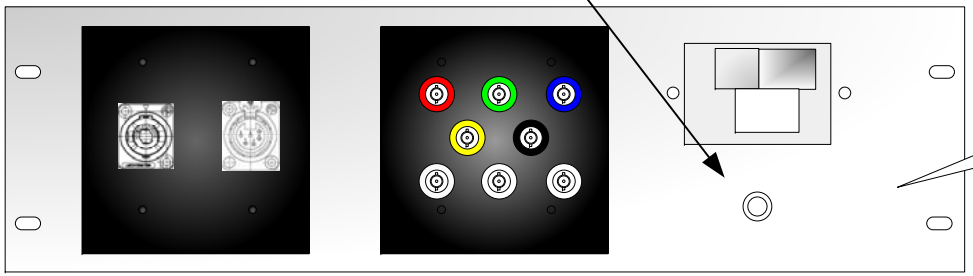
Interconnect Plate
Back side
Presenter Side

RF
connector

Front
Audience Side

Rear
Presenter Side



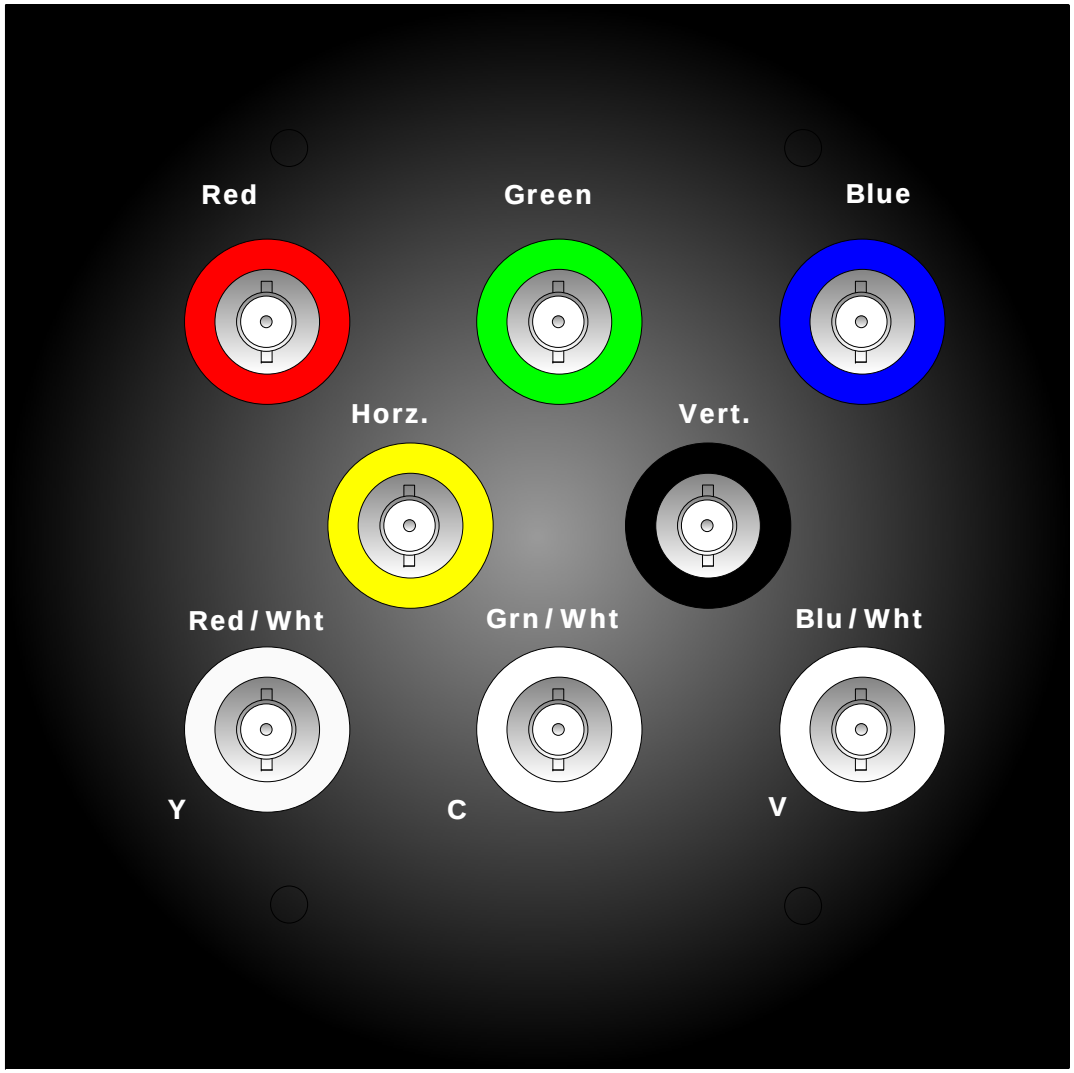


Interconnect Plate
(Front)
Audience Side

Lectern Floor

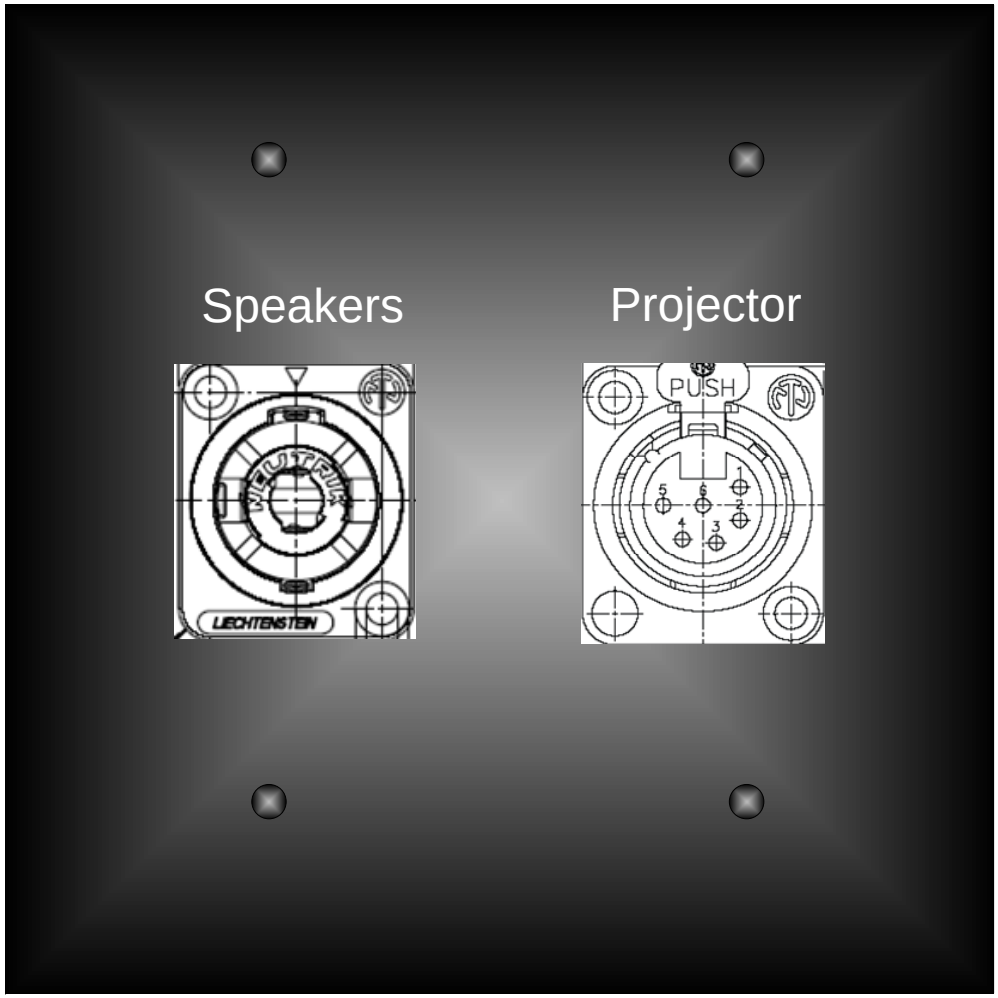
Wall Interface Plate #1

Shown with engraving and Colorized ID rings

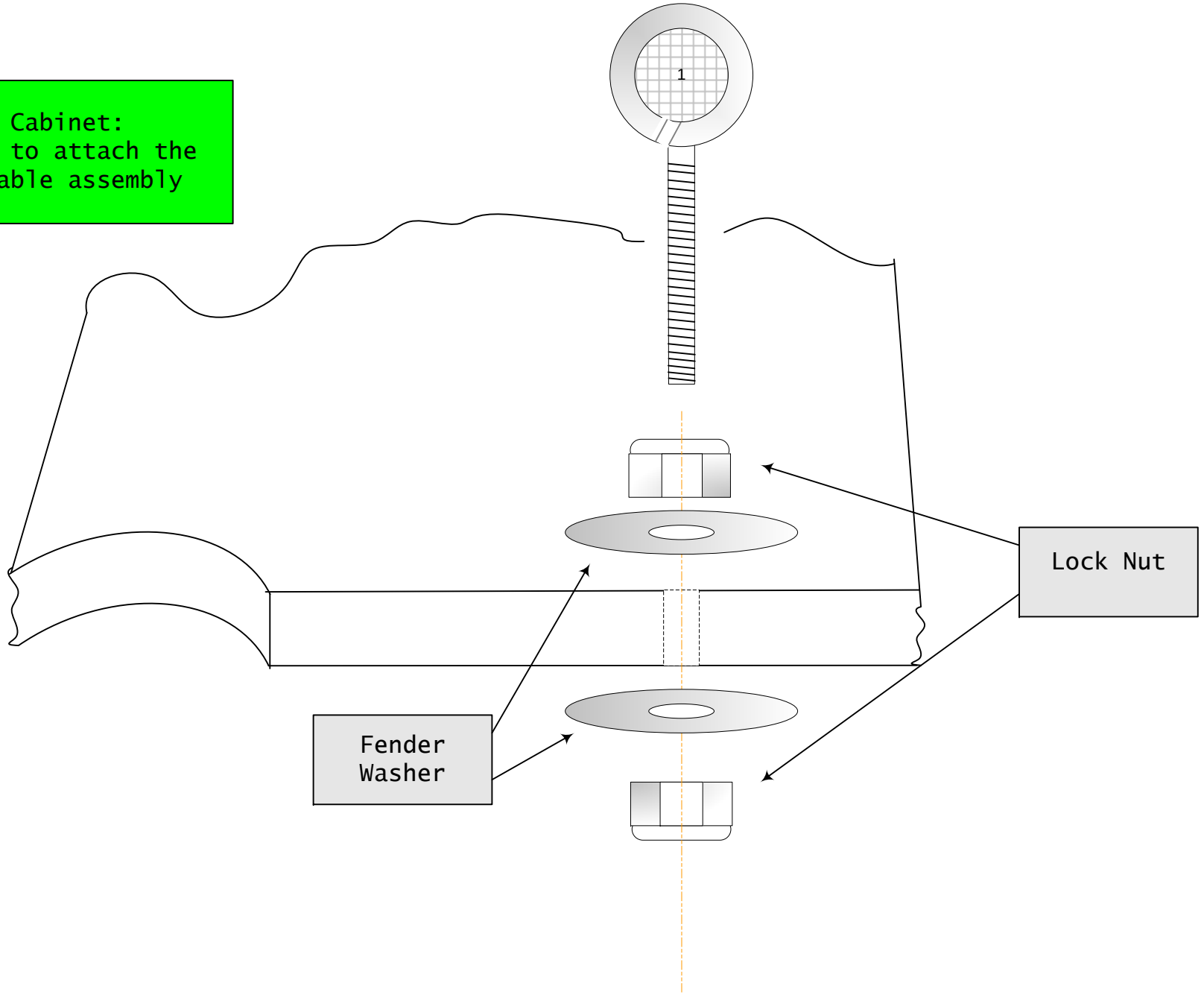


Wall Interface Plate #2

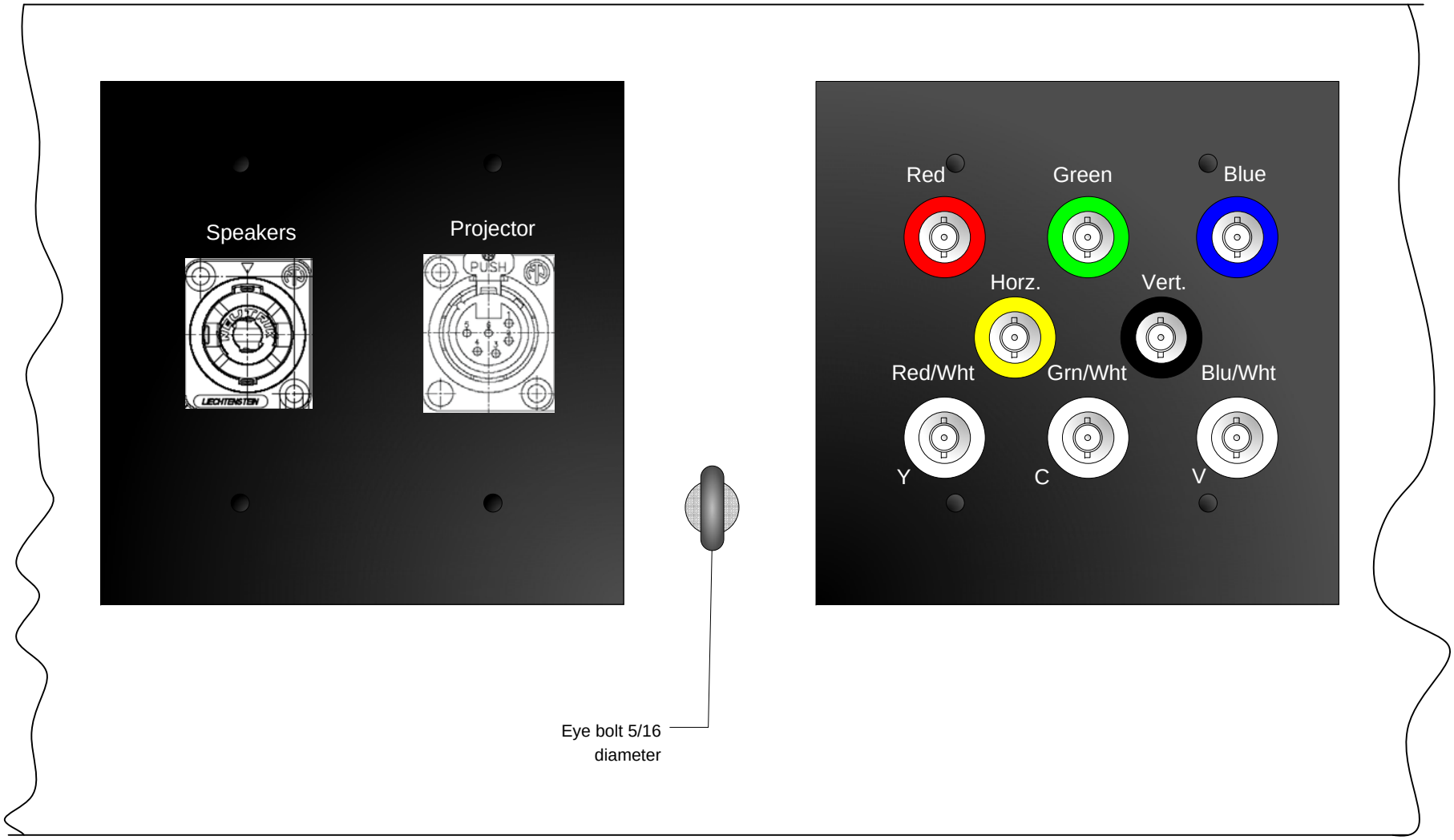
Populated with Neutrik Speakon and Neutrik 6 pin XLR connectors

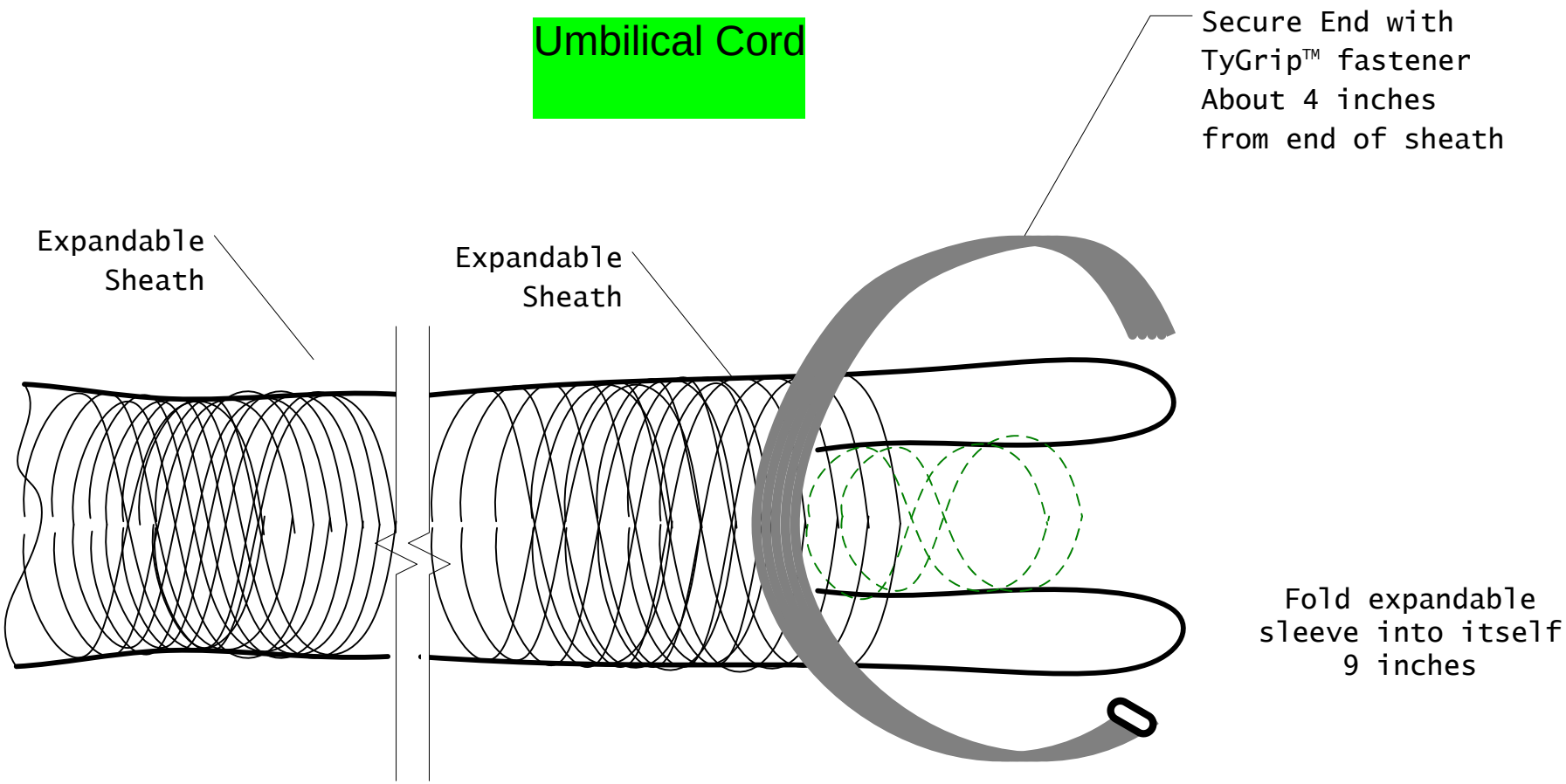


Link Cabinet:
Eye Bolt to attach the
Tether Cable assembly

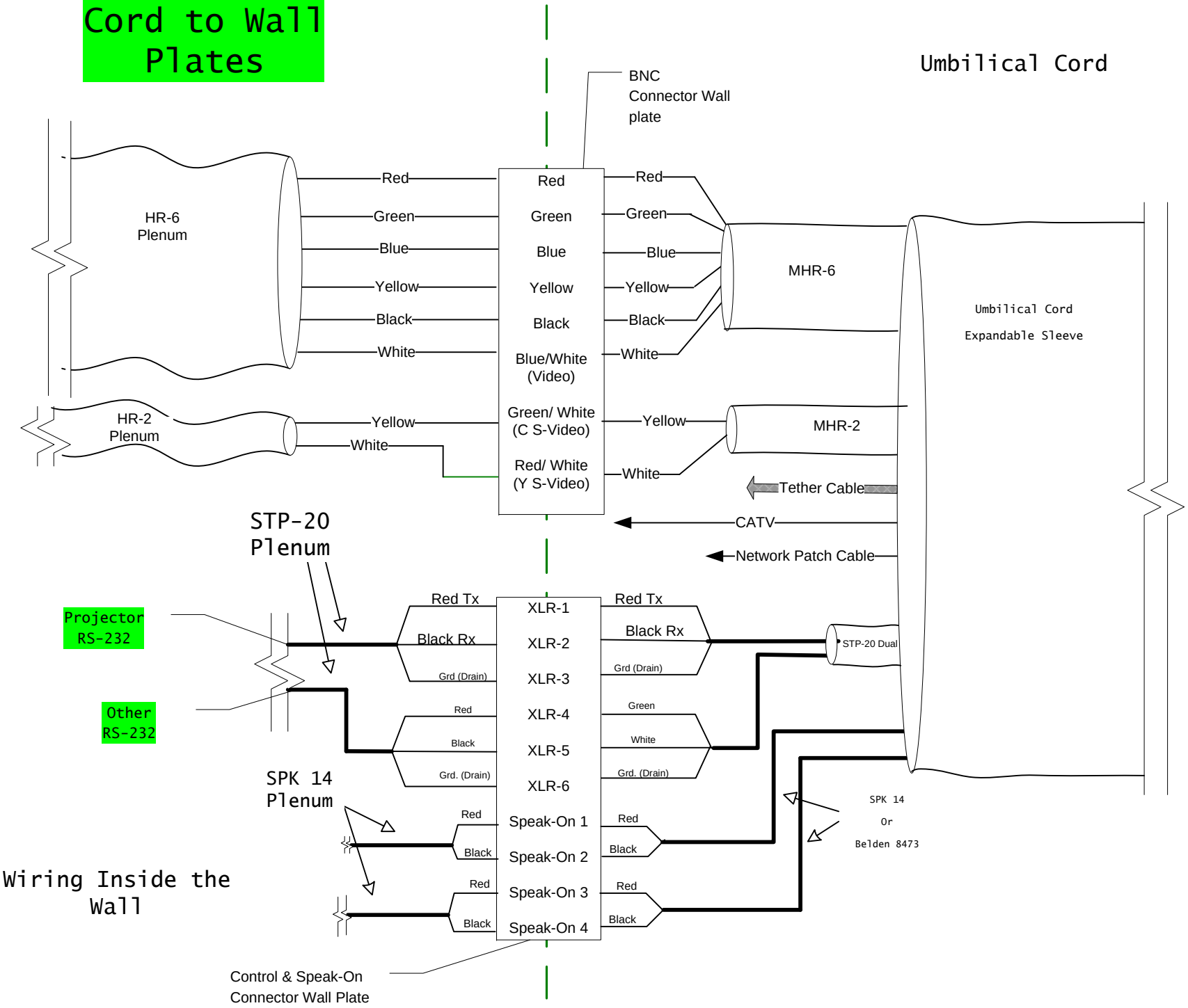


Interface plate layout
On Client wall shown with
populated wall plates

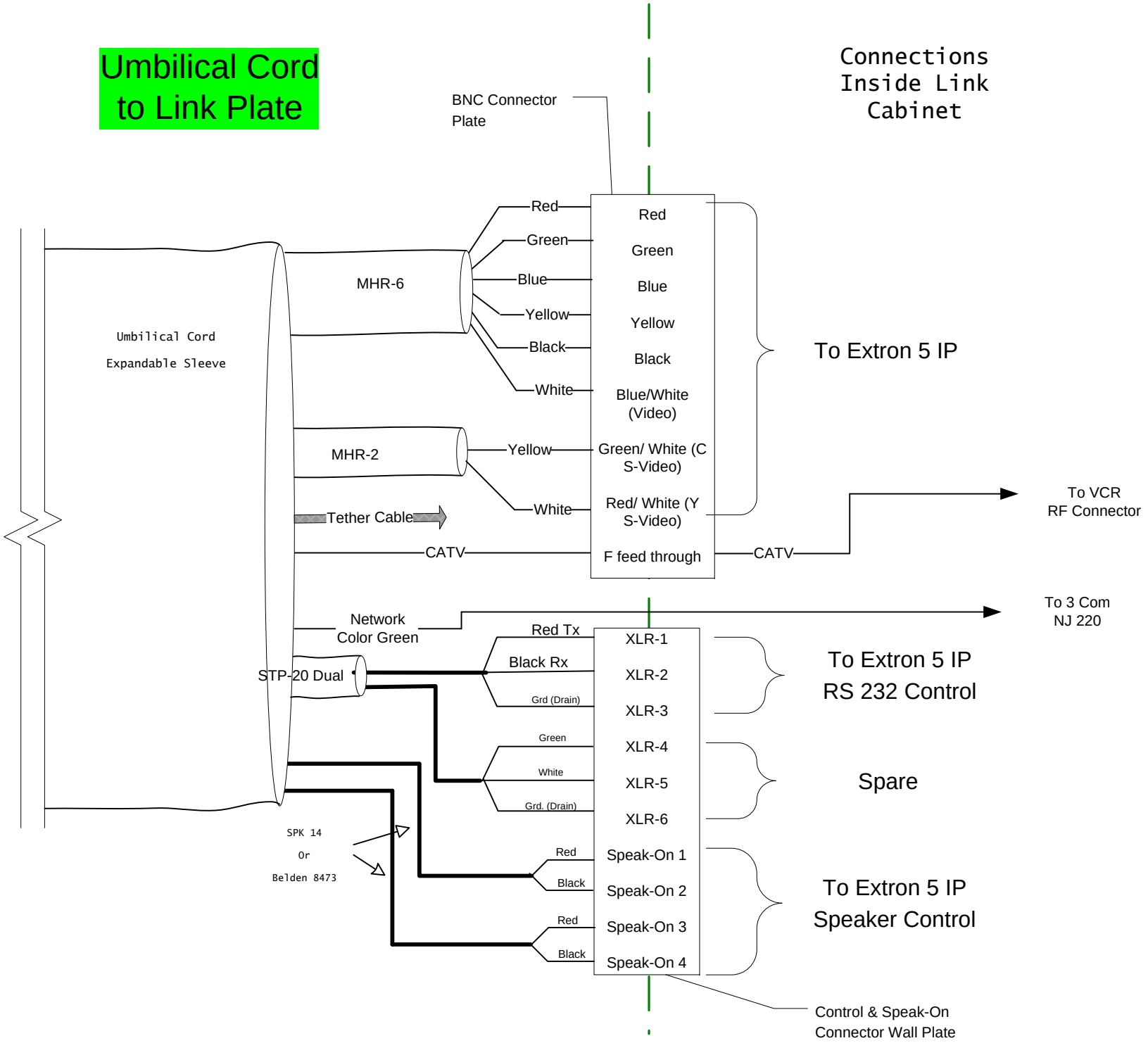



Umbilical Cord
Secure End with
TyGrip™ fastener
About 4 inches
from end of sheath
Expandable
Sheath
Expandable
Sheath
Fold expandable
sleeve into itself
9 inches

Umbilical Cord to Wall Plates



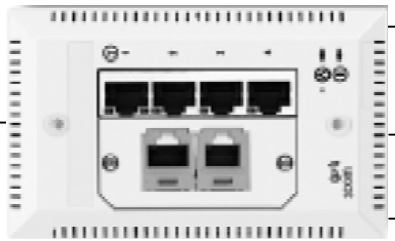
Umbilical Cord to Link Plate



Link Lectern Ethernet Schematic

Cable Cubby

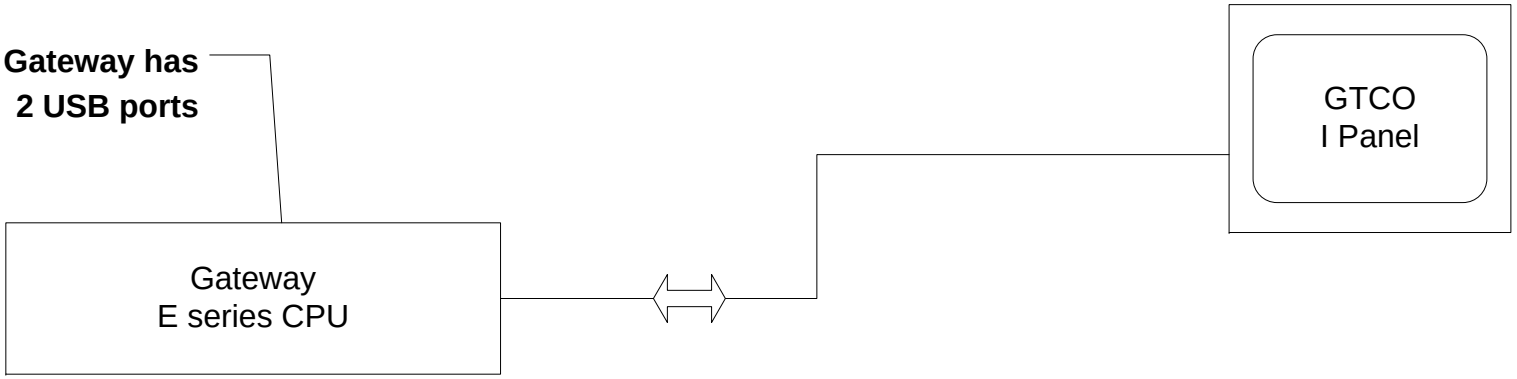
Network Patch Cable
568B Configuration



Gateway
E series CPU

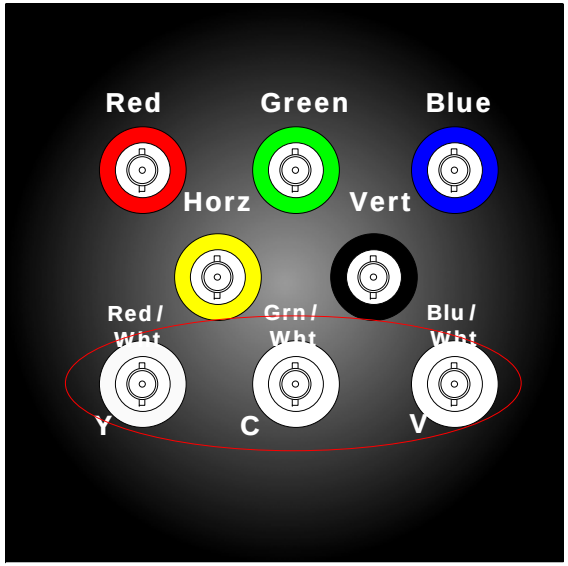
Extron 5IP

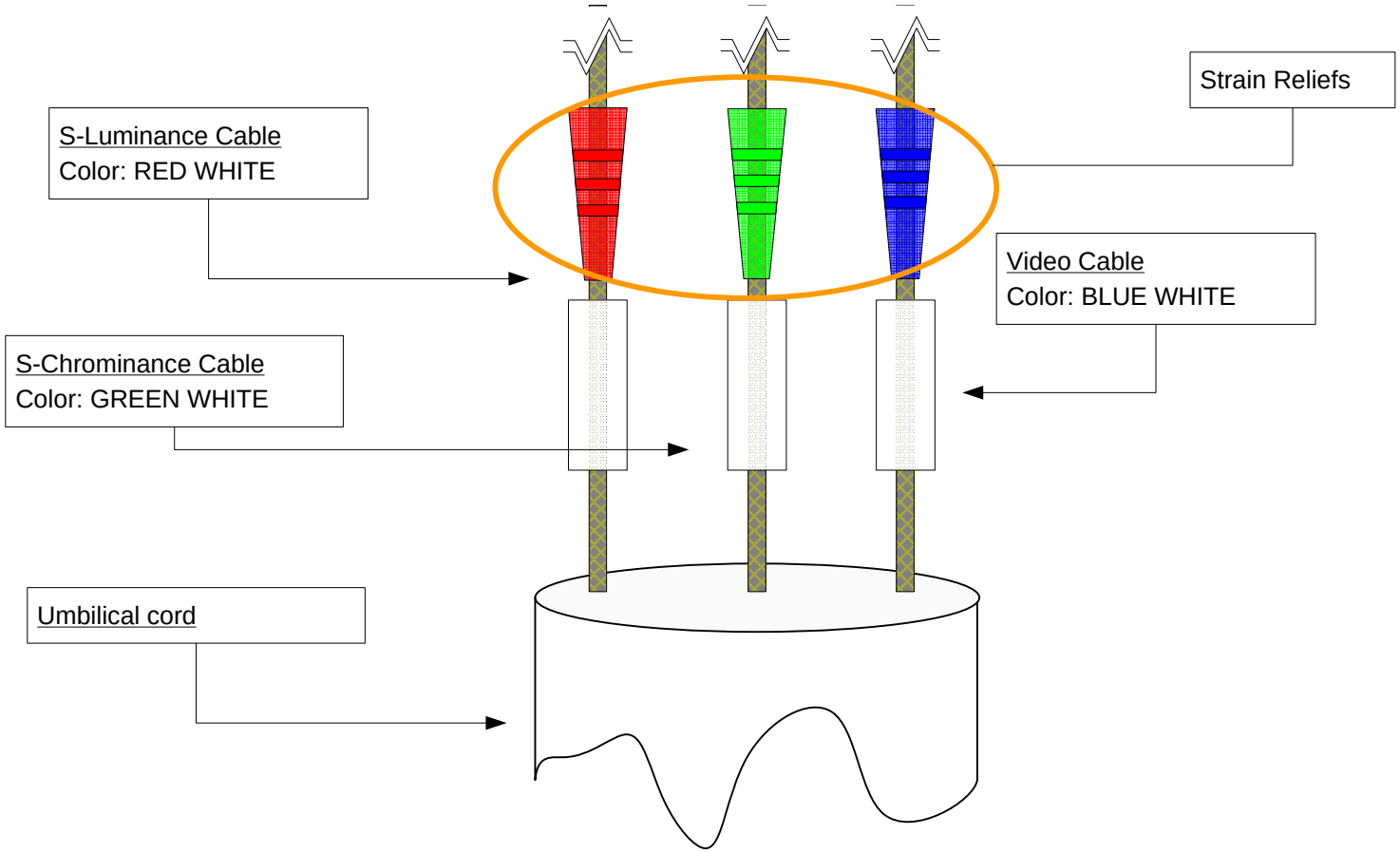
Spectrum Lectern USB Schematic



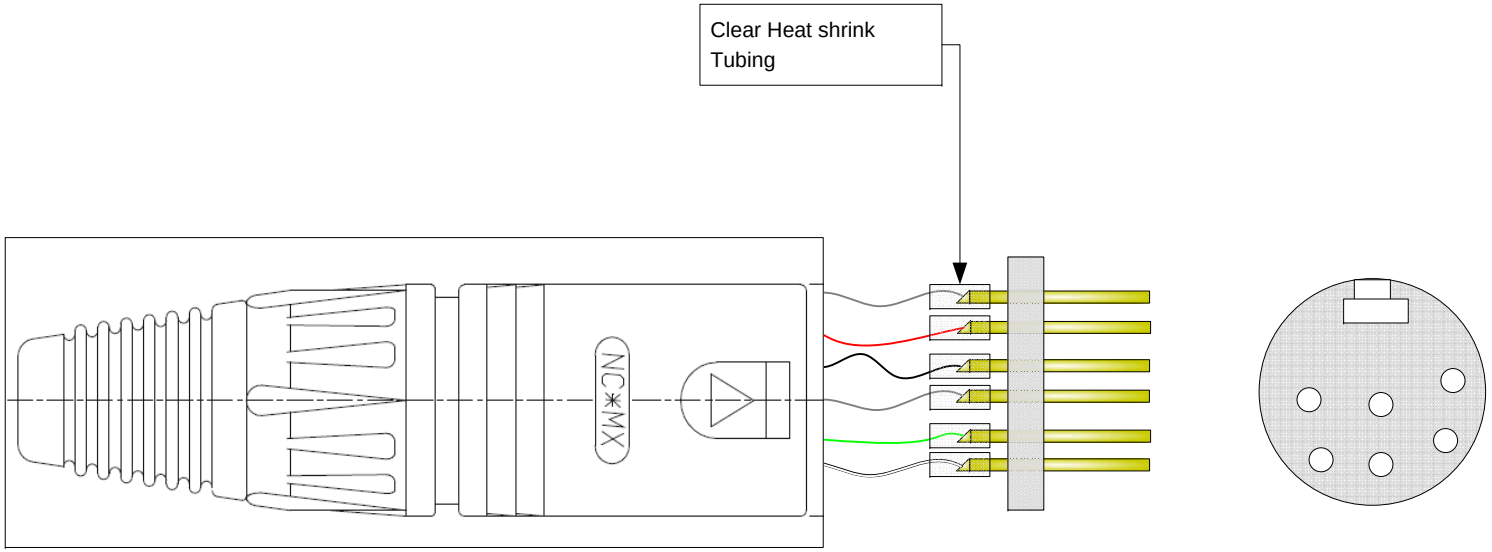
Umbilical Cord Color Codes:

Video, S-Luminance and
S- Chrominance cables from the to the wall plate

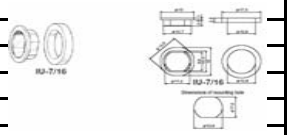


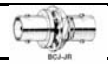


XLR Cable Dress

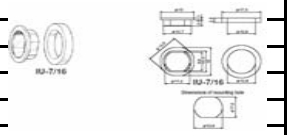


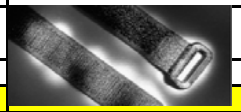
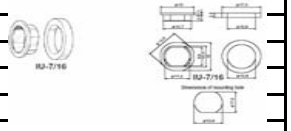
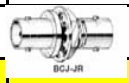
Item	Qty.	Part number	Description	Find where	Notes
			Lectern		
1	1	55122 IDHD Special	42” Link Lectern Cabinet 42”H x 35”W x 30”D Less Privacy surround with Cubby cutout	Spectrum Furniture	
2	1	55132 D	Steel handle	Spectrum Furniture	
3	1	55140 ID	Flip-up Document/ Task Shelf	Spectrum Furniture	
4	1	55141	Custom-Cut Door Logo	Spectrum Furniture	
5	1	97502	Rack Mount Cantilever Shelf	Spectrum Furniture	
6				GTCO Monitor	
			Internal Components		
7	1	3CNJ220-CRM	Ethernet 3 Com Intellijack NJ 220	Network switch	
8	1	3CNJPSL-US	3 Com Power Supply US		
9	1		DVD VCR Combo Player Recorder		
10	1	60-397-02	Switcher w/ Front Panel Control & Amp	Pg 193 Extron 2005 catalog	
11	1	IBAR12ULRA	12 Outlet Rackmount Surge Suppressor	www.alliedelec.com	
12	1	60-486-61	Universal Analog Computer interface	Extron 2005 catalog	
13	1	60-496-02	SCP 150 AAP Black (4 gang)	Pg 204 Extron 2005 catalog	Option A or B
14	1	70-220-02	IRCM-DV Dual function IR control module (Black)	Pg 135 Extron 2005 catalog	
15	1	60-716-0A	Cable Cubby 200 (black)	Pg 99 Extron 2005 catalog	Option A
16	1	60-642-02	SMB 4 Gang	Pg 99 Extron 2005 catalog	Option A
17	1	EB1	1U Blank Panel; Color Black	Pg. 110 Middle Atlantic 2005 catalog	
18	2	EB4	4U Blank Panel; Color Black	Pg. 110 Middle Atlantic 2005 catalog	
19	1	RSH4A Manfacturer Name & Model *	DVD/VCR rack mount adapter	Pg. 98 Middle Atlantic 2005 catalog	* Suffix must include model of Device.
20	1	NLT4FP	Neutrik Speakon Chassis mount connector	Markertek Video Supply	
21	1	NC6FD-L-B-1	Neutrik 6 Pin Female Chassis Mount connector	Markertek Video Supply	
22	1	IU-7/16 RD	Color Coded Wall ID Ring; Color Red	Markertek Video Supply, TecNec	
23	1	IU-7/16 BE	Color Coded Wall ID Ring; Color Blue	Markertek Video Supply, TecNec	
24	1	IU-7/16 YW	Color Coded Wall ID Ring; Color Yellow	Markertek Video Supply, TecNec	
25	1	IU-7/16 GN	Color Coded Wall ID Ring; Color Green	Markertek Video Supply, TecNec	
26	3	IU-7/16 WE	Color Coded Wall ID Ring; Color White	Markertek Video Supply, TecNec	
27	1	IU-7/16	Color Coded Wall ID Ring; Color Black	Markertek Video Supply, TecNec	
28	8	BCJ-JR	Canare BNC Female to BNC Female Chassis Mount Connector	TecNec	
29	1	MP-3541/42	3M Dual Lock MP-3541/42		
30	1		F Female Bulkhead Connector	Markertek Video Supply, TecNec	
			Internal Wire & Cable		
31	1	26-238-14	VGAM 3' MHR, Male to Male (molded)	Extron 2005 catalog	CPU to 190F,
32	1	26-533-12	SY VGAM-RGBHVM (3' / 0.91 m)	Extron 2005 catalog	DOC to Extron
33	1	26-260-01	BNC-5 6' Mini HR (6' / 1.8 m)	Extron 2005 catalog	190F to 5IP
34		MPSRA-MPSRA-10	Stereo Cable 3.5RA - 3.5RA 10 FT	http://www.tecnec.com	Front of 5IP to cubby
35	1	26-510-05	15 Pin Male to Male 6'	Extron 2005 catalog	Front of 5IP to cubby
36	1	26-353-02	S-Video 1' VHSM-BNCM adapter (1' / 0.3 m)	Extron 2005 catalog	DVD to 5IP
37	1	26-238-01	VGAM 6' MHR, Male to Male	Extron 2005 catalog	GTCO to 190F
38	1	-	1' vender made BNC male to BNC male		VCR to 5IP
39	1	26-353-04	S-Video SVHS Male-BNC Male 6'	Pg. 534 Extron 2005 catalog	5IP to Link plate





40	1	26-529-02	Mini 59 SuperFlex-6-6'	Pg. 518 Extron 2005 catalog	5IP to Link plate
41	1		Cat 6 UTP RJ-45 to RJ-46 Stranded 598B Color: Green	Anixter, Comprehensive	3 Com to Cubby
42	1		Cat 6 UTP RJ-45 to RJ-46 Stranded 598B Color: Green	Anixter, Comprehensive	Wall to Switch
43	1		Cat 6 UTP RJ-45 to RJ-46 568B Stranded Color: Blue	Anixter, Comprehensive	5IP to 3Com
44	1		Wire cable		5IP to Link plate RS232
45	1		Wire cable		Speaker to link plate
46	1	617-5311	3M Dual Lock MP-3541/42	Allied Electronics Pg. 378, 2005 Catalog	
			Control cable (intenal to lectern)		
47	1		Beldon 9610 5 conductor, 24awg cable		
			Umbilical Cord		
48	1	22-128-02	MHR-6 Series (RGBHV & Video)		500' spool
49	1	22-123-03	MHR-2 Series (SVHS)		500' spool
50	1	22-098-02	RG6 SHR-1 (RG-6 CATV)	Pg 494 Extron 2005 catalog	
51	2	Belden 8473	SPK 14 (1 pair 14 awg) (Belden 8473)	Extron, Cumberland Electronics	
52	2	180162450	1/4" Snap Hook, Zinc Plated	http://www.webriggingsupply.com	
53	2	12008LT	1/8" Wire Rope Thimble	http://www.webriggingsupply.com	
54	2		1/8' Gripple	Scott Electric, Pittsburough- Midstates Spiral, Philadelphia	
55	1		1/8" Galvanized Aircraft Cable 7X19 Construction	Lowes, Home Depot, EM Herr, etc.	
56	1		Eye bolt 1 1/2" to 2" 5/16 x 24	Lowes, Home Depot, EM Herr, etc.	
57	2		5/16 Lock nuts	Lowes, Home Depot, EM Herr, etc.	
58	2		5/16 Fender washer	Lowes, Home Depot, EM Herr, etc.	
59	1		Cat 6 Network Patch Cable	Anixster	Pre Manufacturered by Anixter
60	1	22-161-03	STP 20 DUAL	Pg. 503 Extron catalog	RS 232 (Rx,Tx Grd Drain) & Spare
61	1	708-4845	Non Fraying Expandable Braided Polyester Sleeving	Alpha GRP-110NF	
62	4	70-119-01	Red MHR BNC Strain Reliefs	Pg 488 Extron 2005 catalog	50 per pkg
63	4	70-119-02	Green MHR BNC Strain Reliefs	Pg 488 Extron 2005 catalog	50 per pkg
64	4	70-119-03	Blue MHR BNC Strain Reliefs	Pg 488 Extron 2005 catalog	50 per pkg
65	2	70-119-04	Yellow MHR BNC Strain Reliefs	Pg 488 Extron 2005 catalog	50 per pkg
66	2	70-119-05	Black MHR BNC Strain Reliefs	Pg 488 Extron 2005 catalog	50 per pkg
67	2	NC6MEZ-B	Neutrik 6 Pin Male Cable connector	Markertek Video Supply	
68	2	NLT4FX	Neutrik Speakon cable end	Markertek Video Supply	
69	2	IU-7/16 RD	Color Coded Wall ID Ring; Color Red	Markertek Video Supply, TecNec	
70	2	IU-7/16 BE	Color Coded Wall ID Ring; Color Blue	Markertek Video Supply, TecNec	
71	2	IU-7/16 YW	Color Coded Wall ID Ring; Color Yellow	Markertek Video Supply, TecNec	
72	2	IU-7/16 GN	Color Coded Wall ID Ring; Color Green	Markertek Video Supply, TecNec	
73	6	IU-7/16 WE	Color Coded Wall ID Ring; Color White	Markertek Video Supply, TecNec	
74	2	IU-7/16	Color Coded Wall ID Ring; Color Black	Markertek Video Supply, TecNec	



75					
76	8	100-186-01	BNC Male MHR Compression connectors	Extron	
77	2	534-1508	TY-Grip™ fastner; Fol-300-50-0	Allied Electronics Pg. 417, 2005 Catalog, Thomas & Betts	
78					
			In Wall Wiring (Plenum cable)		
79	2	22-159-03	STP 20 Plenum	Extron 2005 catalog	
80	1	22-130-02	BNC 6 Mini HR Plenum	Extron 2005 catalog	
81	1	22-129-02	BNC 2 Mini HR Plenum	Extron 2005 catalog	
82	2	22-155-03	SPK 14 Plenum (1 pair 14 awg)	Extron 2005 catalog	
83	10	100-186-01	BNC male Mini HR Compression connectors	Extron 2005 catalog	
			Wall Interface Plates		
84	1	NLT4FP	Neutrik Speakon Chassis mount connector	Markertek Video Supply	
85	1	NC6FD-L-B-1	Neutrik 6 Pin Female Chassis Mount connector	Markertek Video Supply	
86	1	IU-7/16 RD	Color Coded Wall ID Ring; Color Red	Markertek Video Supply, TecNec	
87	1	IU-7/16 BE	Color Coded Wall ID Ring; Color Blue	Markertek Video Supply, TecNec	
88	1	IU-7/16 YW	Color Coded Wall ID Ring; Color Yellow	Markertek Video Supply, TecNec	
89	1	IU-7/16 GN	Color Coded Wall ID Ring; Color Green	Markertek Video Supply, TecNec	
90	3	IU-7/16 WE	Color Coded Wall ID Ring; Color White	Markertek Video Supply, TecNec	
91	1	IU-7/16	Color Coded Wall ID Ring; Color Black	Markertek Video Supply, TecNec	
92	8	BCJ-JR	Canare BNC Female to BNC Female Chassis Mount Connector	TecNec	
			Projector mounts		
93			Chief Projector mounts		
			Ceiling Speakers		
94	6		JBL Control 24 Speakers		

Termination guide for umbilical cord	Cable color	Stran relief color	Designation	Connector @ wall	Connector @ Lectern
22-123-03 Mini HR-2	White	Red	S-video Y Luminance	BNC	BNC
22-123-03 Mini HR-2	Yellow	Green	S-video C Chromance	BNC	BNC
22-128-02 MHR-6 Series (RGBHV & Video)	White	Blue	Video	BNC	BNC
22-128-02 MHR-6 Series (RGBHV & Video)	Red	Red	Red	BNC	BNC
22-128-02 MHR-6 Series (RGBHV & Video)	Green	Green	Green	BNC	BNC
22-128-02 MHR-6 Series (RGBHV & Video)	Blue	Blue	Blue	BNC	BNC
22-128-02 MHR-6 Series (RGBHV & Video)	Black	Black	Black	BNC	BNC
22-128-02 MHR-6 Series (RGBHV & Video)	Yellow	Yellow	Yellow	BNC	BNC
22-098-02 RG6			CATV	F type	F type
22-161-03 STP 20 Dual	Red		RS-232 Tx	NC6MEZ-B Pin 1	NC6MEZ-B Pin 1
22-161-03 STP 20 Dual	Black		RS-232 Rx	NC6MEZ-B Pin 2	NC6MEZ-B Pin 2
22-161-03 STP 20 Dual	Drain		RS-232 Grd.	NC6MEZ-B Pin 3	NC6MEZ-B Pin 3
22-161-03 STP 20 Dual	Green		Spare	NC6MEZ-B Pin 4	NC6MEZ-B Pin 4
22-161-03 STP 20 Dual	White		Spare	NC6MEZ-B Pin 5	NC6MEZ-B Pin 5
22-161-03 STP 20 Dual	Drain		Spare	NC6MEZ-B Pin 6	NC6MEZ-B Pin 6
Beldon 8473/22-151-03	Red		Audio +	NLT4FX Pin 1	NLT4FX Pin 1
Beldon 8473/22-151-03	Black		Audio -	NLT4FX Pin 2	NLT4FX Pin 2
Beldon 8473/22-151-03	Red		Audio +	NLT4FX Pin 3	NLT4FX Pin 3
Beldon 8473/22-151-03	Black		Audio -	NLT4FX Pin 4	NLT4FX Pin 4
Patch Prewired 568B	Green		Network	RJ-45	RJ-46
1/8" Steel cable			Tether	Crimp Thimble & Snap Hook or Gripple, Thimble & Snap Hook	Crimp Thimble & Snap hook or Gripple, Thimble & Snap hook

Outlets	Item	Power supply	Notes
1	Gateway CPU		
2	GTCO I Panel Monitor	x	Allow power supply to float
3	Document Camera		
4	Cable Cubby		
5	DVD / VCR		
6	Extron 5IP		
7	3 Com device	X	Secure to lectren floor via 3M fastener
8	Extron 190F	x	Secure to lectren floor via 3M fastener